

Surface Water Quality Regulation

16 October 2012

Overview

- What we protect – beneficial uses
- Standards used to protect uses
- What if standards are not met?
 - 303(d) and TMDL processes
- Reservoir impacts on water quality
- Permitting
 - NPDES, 404, 401, State
- CVSALTS
- Coordinated monitoring

Disclaimer

- Many things highly simplified
- Focused on San Joaquin River watershed
 - Upstream of Delta
 - Leaving out many things not applicable to the watershed
- Many 30 second topics could take all day

Beneficial Uses – what we protect

- Water Quality & Water Rights BUs different
 - Sources
 - Clean Water Act – Fishable / Swimmable
 - State Board – Sources of Drinking Water Policy
 - Water Quality Control Plans (Basin Plans)
 - Set beneficial uses
 - Water quality objectives
 - Implementation plans
- Sacramento/San Joaquin Rivers & Tulare Lake Basin Plans

Beneficial Uses In Basin Plan

Surface Waters

- Municipal and Domestic Supply
- Agricultural Supply
- Industrial Service Supply
- Industrial Process Supply
- Ground Water Recharge
- Freshwater Replenishment
- Navigation
- Hydropower Generation
- Water Contact Recreation
- Non-Contact Recreation
- Commercial and Sport Fishing
- Aquaculture
- Warm Freshwater Habitat
- Cold Freshwater Habitat
- Estuarine Habitat
- Wildlife Habitat
- Preservation of Biological Habitats of Special Significance
- Migration of Aquatic Organisms
- Spawning, Reproduction and/or Early Development
- Shellfish Harvesting

Beneficial Uses In Basin Plan Ground Waters

- Municipal and Domestic Supply
- Agricultural Supply
- Industrial Service Supply
- Industrial Process Supply

Beneficial Uses – Water Rights

- California Water Code
- ???????

Water Quality Standards

- The Clean Water Act requires each state to adopt water quality standards
 - Sources:
 - USEPA – California and National Toxics Rules
 - State Board – Bay/Delta Plan
 - Regional Board - Basin Plan
 - Consists of
 - Designated Uses
 - Water Quality Criteria based upon the uses
 - Anti-Degradation Policy

Types of Objectives

- Numeric – a specified number
 - USEPA – National and California Toxics Rules
 - State Board
 - Bay Delta Plan
 - Delta salinity
 - SJR dissolved oxygen at Stockton
 - Basin Plan
 - Delta heavy metals
 - Dissolved Oxygen
 - Some salinity standards
 - Primary and Secondary MCLs

Types of Objectives

- Narrative – does not specify a number
 - Clean Water Act – fishable / swimmable
 - Basin Plan
 - No toxics in toxics amounts for aquatic life
 - Chemicals can't impair beneficial uses
 - Consider interaction of pollutants
 - Site-specific interpretation of narrative
 - Review applicable science / literature
 - Ammonia, chlorine, temperature....

Objectives can be variable

- Ammonia
 - Toxicity varies with pH and temperature
 - Increasing pH = increased fish toxicity
 - Decreasing pH = increased copepod toxicity
- Metals
 - Copper, zinc, lead
 - Increasing hardness = decreased toxicity
- Reservoirs, wheeling water, etc. can change receiving water temperature, hardness & pH
 - Changes toxicity of some pollutants

Concern with objectives

- Keep discharging pollutants until river is “full” of pollutants up to maximum allowed by each objective?
 - No one downstream can discharge anything more
 - No safety factor if an objective is wrong
 - Don’t understand most interactions
 - Do we want every water body just barely able to support beneficial uses?

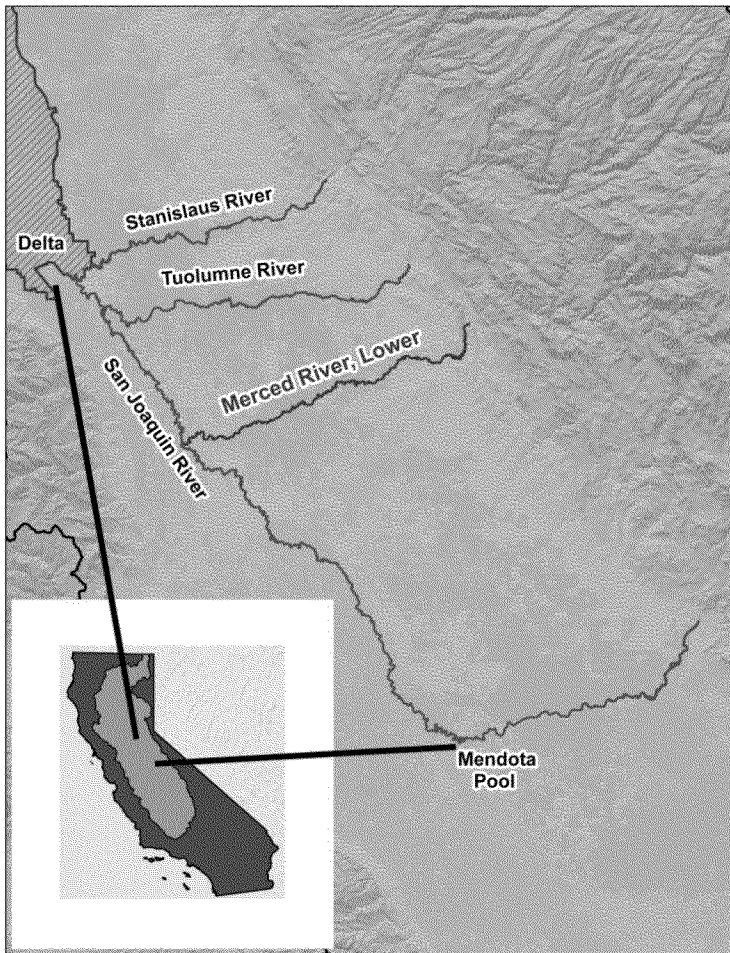
Anti-Degradation Policy

- State & Federal versions
 - Similar, but different in detail
 - Supplemented by State Board Decisions
- Preserve existing water quality
- NO DISCHARGE OF POLLUTANTS unless
 - To the maximum benefit of the People of the State
 - Utilizes ‘best practicable treatment or control’
 - Practicable includes economics
 - Situation-specific determination
 - Determined with adoption of permit

303d

San Joaquin River Basin

303(d) Listings

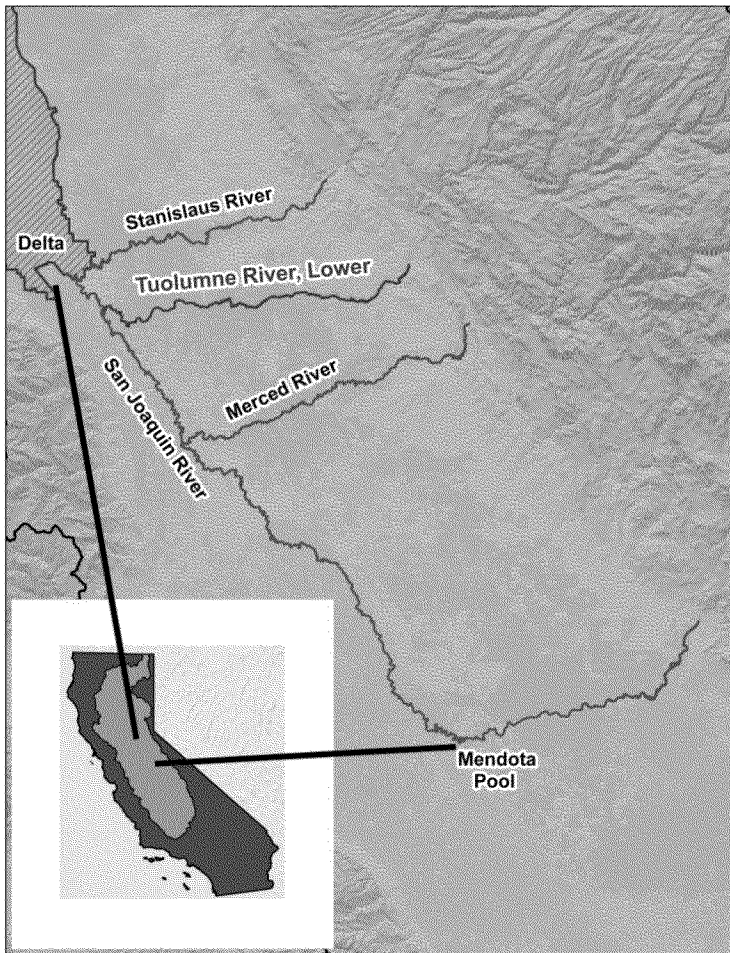


Merced River, Lower (McSwain Reservoir to San Joaquin River)

- Chlorpyrifos**
- Diazinon**
- Escherichia coli (E. coli)
- Group A Pesticides
- Mercury
- Temperature
- Unknown Toxicity

San Joaquin River Basin

303(d) Listings

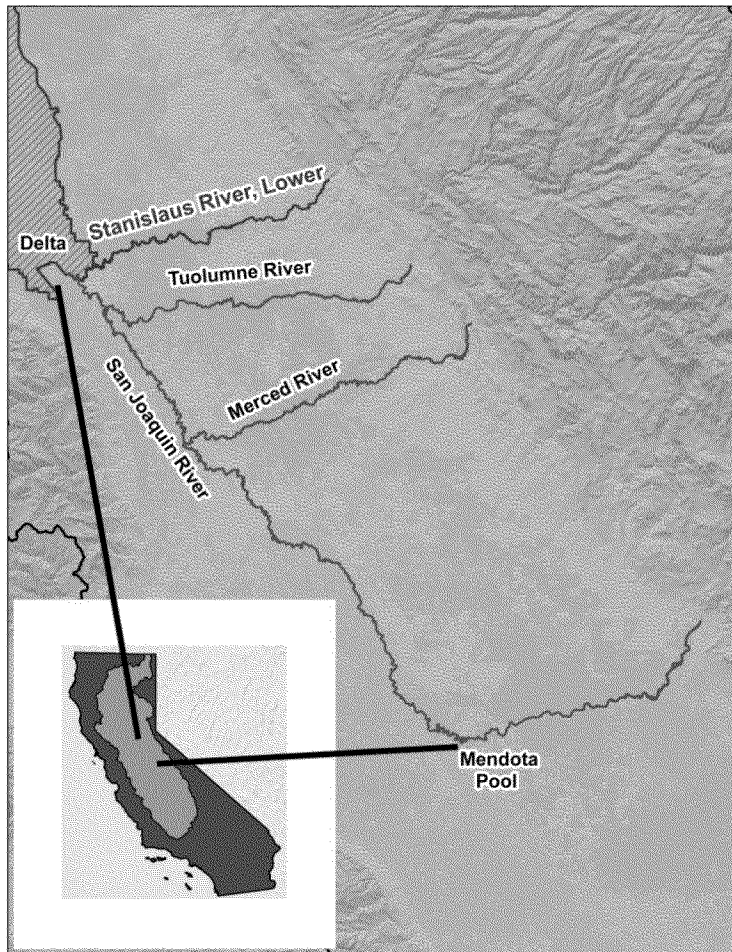


Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)

- Chlorpyrifos**
- Diazinon**
- Group A Pesticides
- Mercury
- Temperature
- Unknown Toxicity

San Joaquin River Basin

303(d) Listings

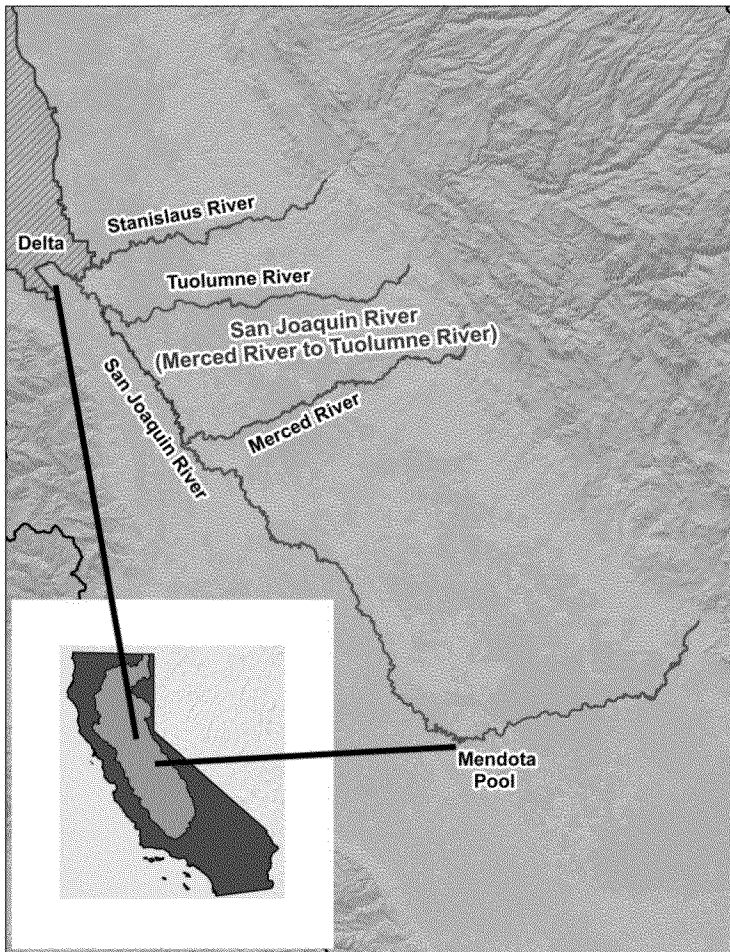


Stanislaus River, Lower

- Chlorpyrifos**
- Diazinon**
- Group A Pesticides
- Mercury
- Temperature
- Unknown Toxicity

San Joaquin River Basin

303(d) Listings



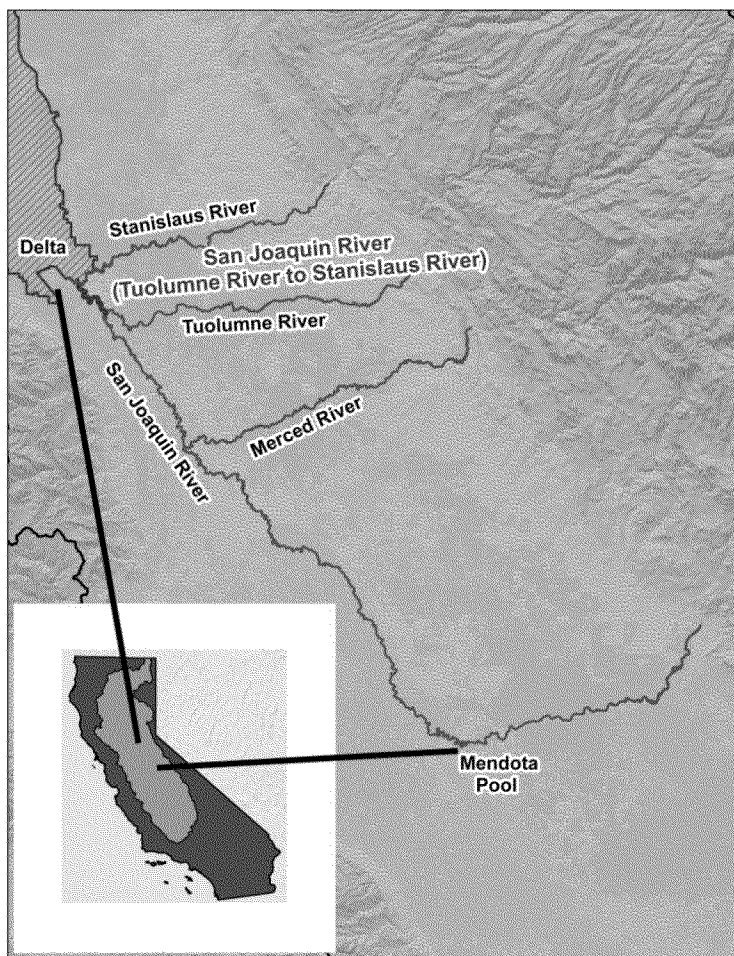
San Joaquin River

(Merced River to Tuolumne River)

- Boron
- Chlorpyrifos*
- DDE
- DDT
- Electrical Conductivity
- Group A Pesticides
- Mercury
- Temperature
- Unknown Toxicity
- alpha-BHC (alpha-HCH)

San Joaquin River Basin

303(d) Listings



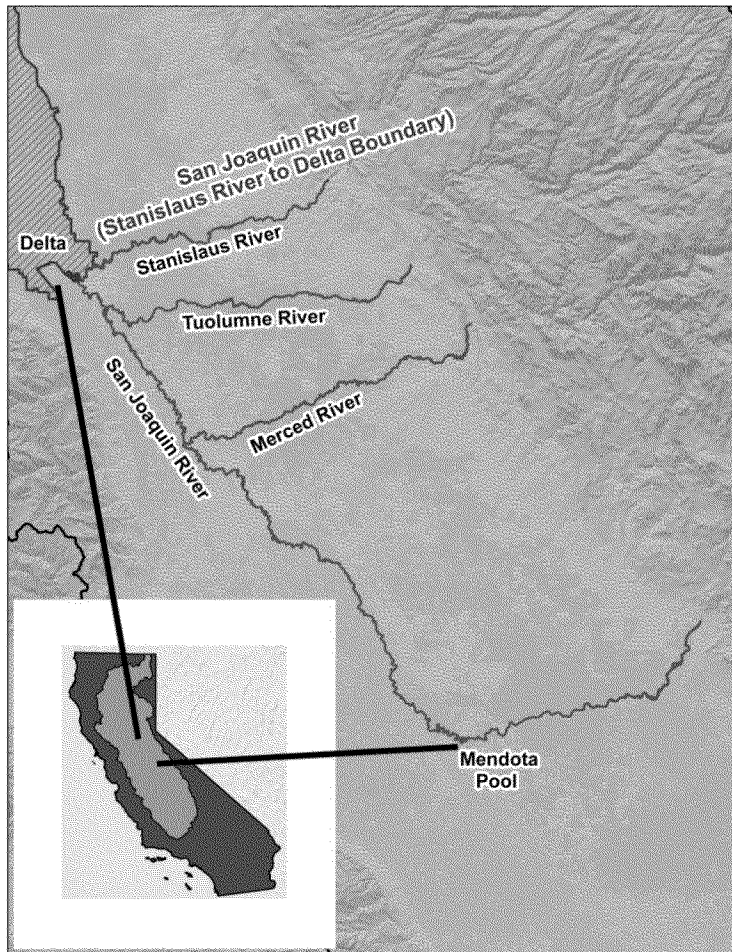
San Joaquin River

(Tuolumne River to Stanislaus River)

- Chlorpyrifos*
- DDT
(Dichlorodiphenyltrichloroethane)
- Diazinon*
- Electrical Conductivity
- Group A Pesticides
- Mercury
- Temperature
- Unknown Toxicity

San Joaquin River Basin

303(d) Listings



San Joaquin River

(Stanislaus River to Delta Boundary)

- Chlorpyrifos*
- DDE
- DDT
- Diuron**
- Electrical Conductivity*
- Escherichia coli (E. coli)
- Group A Pesticides
- Mercury
- Temperature
- Toxaphene
- Unknown Toxicity

TMDL Prioritization/Scheduling

303(d) List – TMDL completion schedule

Approximate dates of Board adoption

SWRCB Listing Policy Section 5 TMDL Scheduling Criteria

Waterbody significance

Degree of Impairment

Potential for protection and recovery

Public Concern

Funding

Data availability

Other criteria

Triennial Review (e.g. TMDLs for all 2006 303(d) list by 2019)

Strategic Plan -

Delta Plan

Board Direction

Basin Plan Requirements

Regulatory Options

Impaired Waters Policy (State Board, 2005)

- Delist- standards are met
- Correct the standard
- Certification of Regulatory or Non-Regulatory Action
- Board resolution establishing the TMDL - Single action by the Board-
- **Basin Plan Amendment establishing TMDL**

What is a TMDL

- Scientific process to determine the Total Maximum Daily Load for a given pollutant that can be discharged to a waterbody and achieve compliance
- Considers natural and human contributions

TMDL Process

- Determine / evaluate water quality objective:
 - Use existing objective – Vernalis EC standard
 - Adopt new objective in Basin Plan – diazinon
- Determine existing sources and associated loads
- Determine needed load reductions
- Develop implementation plan and schedule
 - Phases, re-evaluation points

Flow in TMDLs

- Dilution – dilution is NOT a beneficial use
 - Possible waste and unreasonable use
- Increased flow reduces residence / reaction time
 - Stockton Deep Water Channel / DO
- Change hardness / pH/ temperature
- If objectives cannot be met only with pollutant controls, or if control are draconian, flow augmentation may be recommended
- State Board would have to implement flow changes

Basin Plan adoption process

- Scoping session
 - Basin Plan is CEQA-equivalent process
- Stakeholder process
- Develop proposal(s)
- 45 day public comment period
- Regional Board hearing / adoption
- State Board hearing / adoption (RB staff)
- Office of Administrative Law review
- USEPA approval of objectives

SJR Basin TMDLs

- Adopted
 - Selenium
 - Diazinon and Chlorpyrifos
 - Dissolved Oxygen - Stockton Deepwater Ship Channel
 - Salt & Boron between Stanislaus River and Vernalis
- In Development
 - Upstream salt (CV SALTS)
 - Tributaries diazinon and chlorpyrifos
 - Other Pesticides: diuron, pyrethroids (tributaries), organochlorines

Selenium

SJR Diazinon and Chlorpyrifos TMDL

- Insecticides commonly used by ag (common urban use before 2005)
- Acute toxicity to aquatic invertebrates – 303(d) list.
- TMDL Approved in 2006 by EPA
- Main Stem SJR WQOs, TMDL -concentration-based
- Implementation + Monitoring Requirements
- Allocations, Loading Capacity concentration based
 - don't vary with flow changes
 - dilution increases assimilative capacity.
- East and Westside Coalitions Monitor + Report through ILRP
 - Achieved WQOs/TMDL in SJR before compliance date (Dec 2011)
 - Delisted diazinon in 2 SJR segments in 2010

Stockton DWSC Dissolved Oxygen TMDL

- Primary source of oxygen demand coming from upstream sources (e.g., algae, City of Stockton, and upstream NPS)
- Named in toxic hotspots studies
- Low DO/organic enrichment – 303(d) list
- TMDL approved in 2007 by EPA
- ILRP + NPDES, Water Right permit holders, geometry (US ACE)
- Main Stem SJR WQOs, TMDL -concentration-based loading capacity
- Implementation through study requirements and development of mitigation technology (studies and operation of new technology are underway)
- TMDL allocations equal to the loading capacity

Salt (EC) and Boron

Mercury

- Delta Mercury Control Program (TMDL)
- San Joaquin River- future TMDL
- Statewide Mercury Impaired Reservoirs
 - New Melones Reservoir
 - Tulloch Reservoir
 - McClure Reservoir
 - Modesto Reservoir
 - Turlock Lake
 - Woodward Reservoir
 - Don Pedro Lake
 - Hetch Hetchy Reservoir

Statewide Mercury Control Program for Reservoirs

- Program Elements

- Inorganic sources

- Controls for mines, wastewater, storm water, atmospheric deposition

- Reservoir management

- Evaluate water management & chemistry, nutrients

- Fisheries management

- Evaluate current fisheries management practices for native and non-native species

Permitting

Surface Water discharges

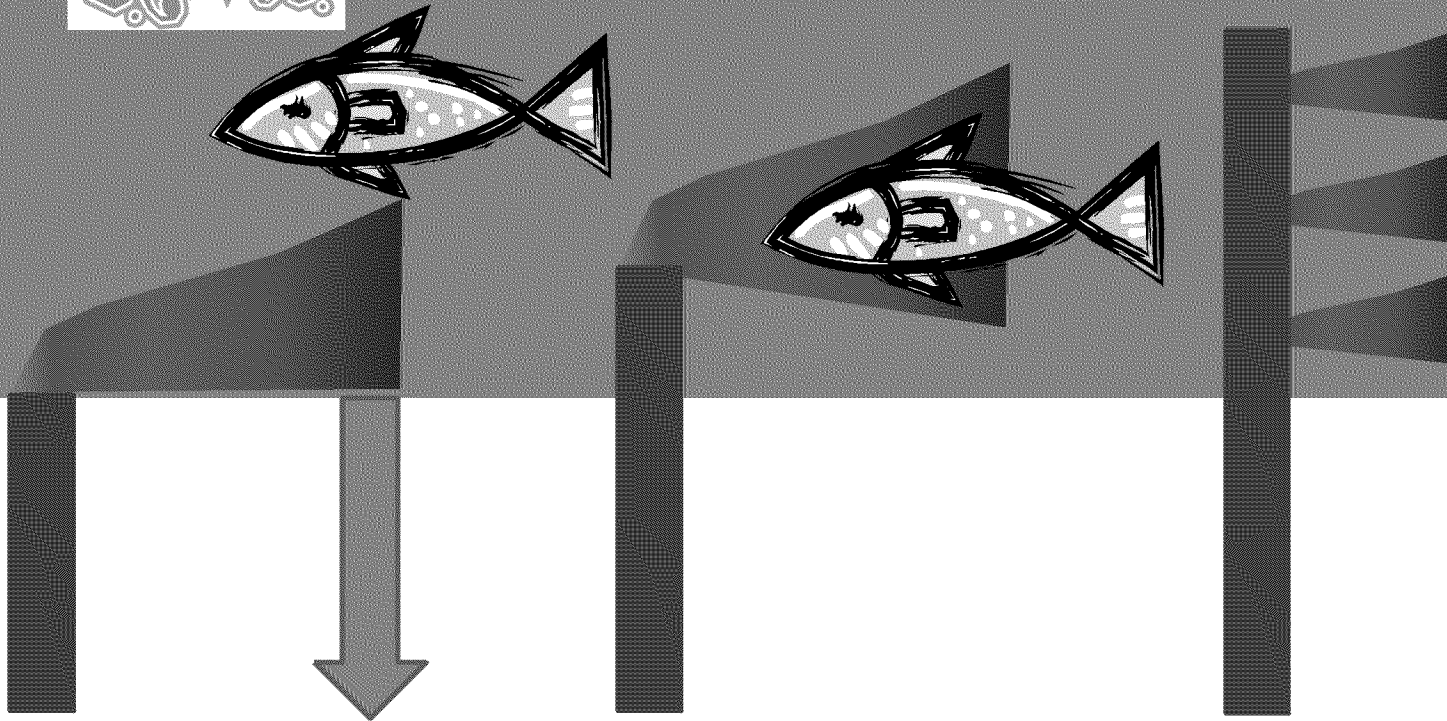
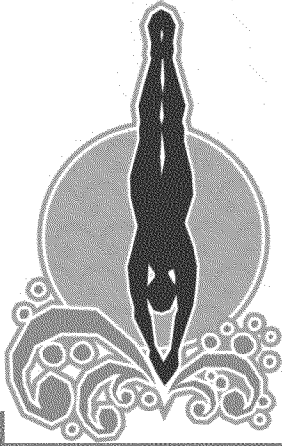
- CWA 402 – NPDES – State and Regional Boards
 - Ag irrigation and stormwater wastewater exemptions
- CWA 404 – USACOE
 - Dredge & fill
 - In water or below high water line construction
- CWA 401 WQ Certifications
 - Actions other than for FERC hydropower
 - FERC hydropower
- California Water Code
 - irrigated ag discharges
 - dredge/fill activities

NPDES Permits

National Pollutant Discharge Elimination System

- Determine pollutants in discharge
- Effluent limits if “reasonable potential” to cause river to exceed objectives
- Effluent limits \leq water quality objectives, or
- Characterize receiving water and consider dilution
 - Set effluent limits to protect river after mixing

Discharge to River



NPDES Permit types

- Individually adopted permits
 - Sewage treatment plants, large industries
 - Large municipal stormwater permits
 - MS4s – municipal separate storm sewers
 - Months to years to adopt
- General NPDES Permits
 - Groups of similar discharges with similar conditions
 - Low threat (no NPDES exemptions)
 - Dewatering
 - Construction stormwater
 - Industrial stormwater (corporation yards)
 - Hours to weeks to obtain administratively

401 Certifications

- Certify compliance with State regulations for federal permits or actions
 - US Army Corps of Engineers 404 Permits
 - Certain types of grant / loans
 - FERC Permits
- FERC and water diversion Certifications handled by State Board, Div of Water Rights
- The rest handled by Regional Board

CEQA

- NPDES Process is CEQA equivalent
- Basin Planning / TMDLs functionally equivalent
- CEQA needed for
 - 401 Certifications
 - Waste Discharge Requirements

CV-SALTS

Monitoring Directory

- <http://www.centralvalleymonitoring.org/>
- 05/06 Began initial development
- 08/09 Additional funds were added
- Provides access to program and metadata for current water quality monitoring efforts in the Central Valley
- Improves coordination
- Links to water quality data from source